

2957 Kalakaua Avenue
Honolulu, Hawaii 96815
May 2001

Jonna Wieting, Chief
Marine Mammal Conservation Division
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, Maryland 20910-3226

Dear Ms. Wieting,

I am writing to express my concern about the U.S. Navy's application for permission to deploy the low-frequency active sonar (LFAS) system, worldwide for five years and hope that it will be denied by the National Marine Fisheries Service.

On Saturday, April 28, 2001, I attended the hearing held at a Waikiki hotel on the proposed surveillance towed array sensor system, low-frequency active (SURTASS-LFA) sonar tests.

I appreciate that all who wanted to

- 6

Present testimony were given the opportunity. For awhile we weren't sure that they would. There seemed to be some kind of time restrictions. Most hearings, that I have attended over many years, always had testifiers supporting & opposing an issue. The one on Saturday seemed to have only the Navy man giving testimony in support of the sonar tests.

I wish that there would have been a recording of the sound that is emitted by these sonar tests.

I think that the National Marine Fisheries Service personnel should have been invited to observe previous tests and should now be included to participate in future sonar tests. Labeling some operations as classified can also make it suspect. Our enemies may know as much as our government knows about all this. When they have been accused of spying, their response has been that all they had to do was read all the information that is available to the public. It just might be too scientific for us, but they know

-3

what has any value. We learned with the Greenville incident that all the technology available won't protect one hundred percent, if there is just one weak link in the human chain. A vigilant and well-trained crew is so important.

On page 11 of the MMPA Bulletin Issue No. 21-4th Quarter 2000, it states that a dB greater than 180 will not be deployed within 12 nautical miles of any coast including offshore islands anywhere in the world. That statement isn't reassuring. The Navy has done experiments with dolphins. There have been denials that any of them were trained for wartime use, such as applying explosives to ships. For some reason we have doubts about their denial. As difficult as it was for the United States Navy to say, "We are sorry," to the families of the Japanese men whose deaths they caused, I wonder if the Navy really cares about the marine life which can't protest.

It was back in 1994 that I first started reading articles about the "sea boomer."

It was labeled the Acoustic Thermometry of Ocean Climate (ATOC) project. That was supposed to provide data to help determine the effect of global warming on oceans. There were protests against those tests too. All these sonar tests arouse feelings of grave concern. No one can state unequivocally that the (SURTASS-LFA) sonar tests and (ATOC) project have not harmed the marine living residents in our oceans.

Those who want to justify permitting these tests use the excuse that the oceans are already full of noises from other sources, such as large ships, ocean drilling and active sonar. The article didn't specify what is creating the active sonar noise. Have any studies been done by the Navy, as to whether or not these noises have effected the life in our oceans?

Sometimes I really don't understand the actions of humans. We seem to be able to knowingly cause pain and misery and even death for all creatures which inhabit this planet. There is really no safe place,

We know how loud noise can hurt humans. It not only can cause hearing loss, but can be disturbing enough to some people that they attack the noise maker, and even kill that person. That has happened here in Honolulu. There are too many "unknowns" about whales, dolphins, turtles, sharks, etc. We do know how dogs react to the noise from firecrackers and loud thunder. Our zoo is next to the Waikiki Shell in Waikiki. At certain concerts the orchestra played "The Overture of 1812" which had gunshots. The zoo director said that whenever that selection was performed there were some animals which would slam themselves against the fence and get bruised. Playing that music was finally discontinued. In documentaries on TV we see the behavior of wild animals when there is a gunshot. Even a branch breaking under someone's foot can set off an alarm. The reaction may be to "freeze" or take flight. That sensitivity and instinctive reaction help them survive. Can we rule out that our ocean inhabitants are any less sensitive to noise? What the public is hearing and reading about what is

Happening to them in conjunction with the Sonar tests may be just a coincidence, but they have aroused feelings of grave concern, too. The possibility that they are having a very serious detrimental effect on many of ^{The} marine residents is real, with a big focus on how whales are affected. We should be trying to reduce the noise, which intrudes into their ocean home. How do we know that our enemies aren't carrying on the same kinds of tests. From what I understand, for our Navy to detect the submarine of an enemy, or friend, our sonar would have to be on 24 hours a day, 365 days of the year, and in all waters.

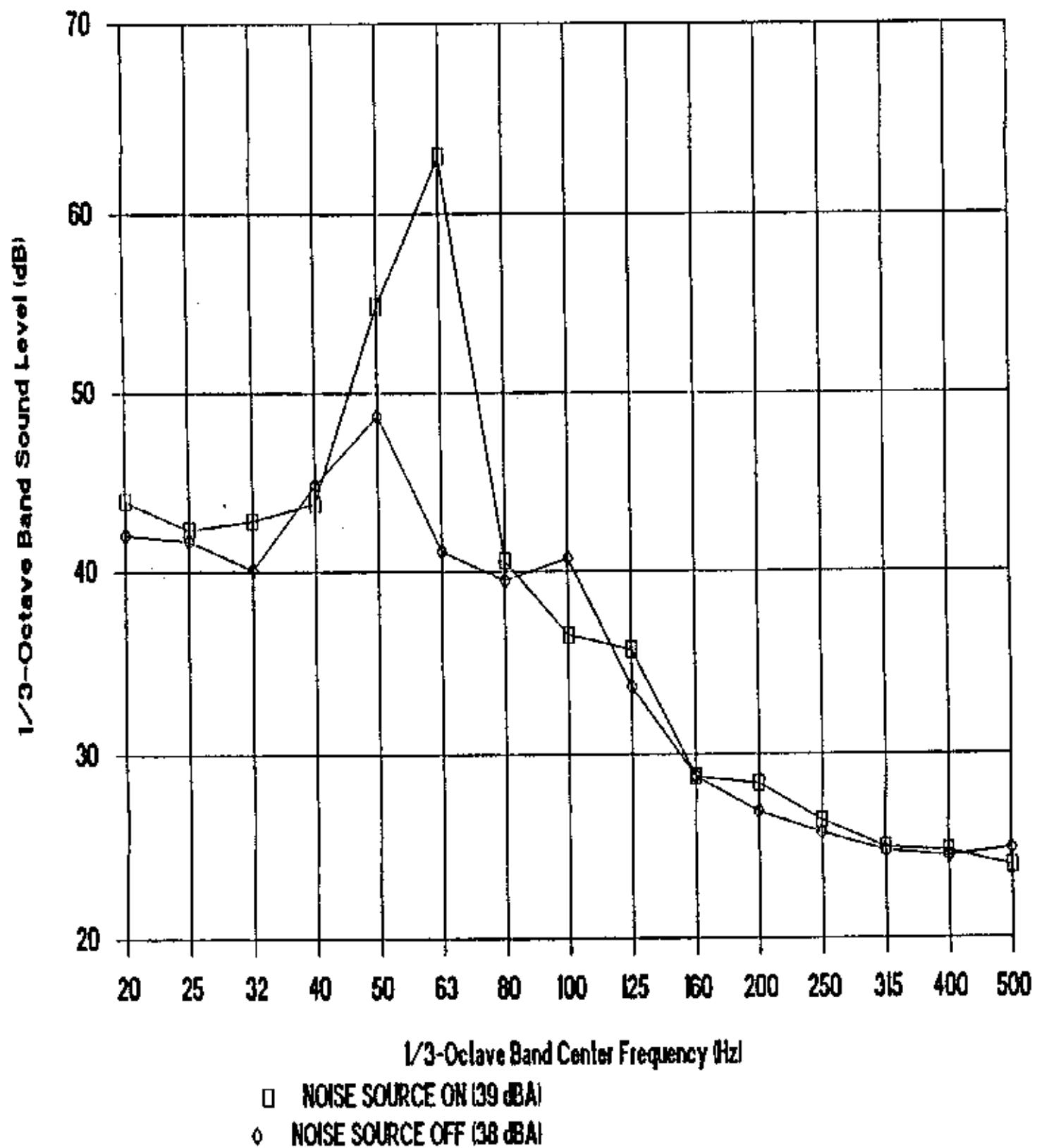
I'm enclosing the results of an acoustic test done in my apartment, when a noise "invaded" my living room. It started in November 1990 and continued to July 1994. There was a cycle. I kept a record of it for many months. It gave me a headache, a problem I didn't usually have. It was very strange, when my small fan was blowing on my face, or a noisy car went by outside the headache stopped immediately. After the car passed the headache came back instantaneously! There wasn't any noise in the center of the room,

why one day the noise just stopped permanently I will never know, but I am most grateful. I really thought that it could have damaged my brain because it was that penetrating and the headache was that bad. The noise wasn't even loud like the ~~sonar~~ tests may be, but it was the type of noise. The man from the acoustical company could not help me.

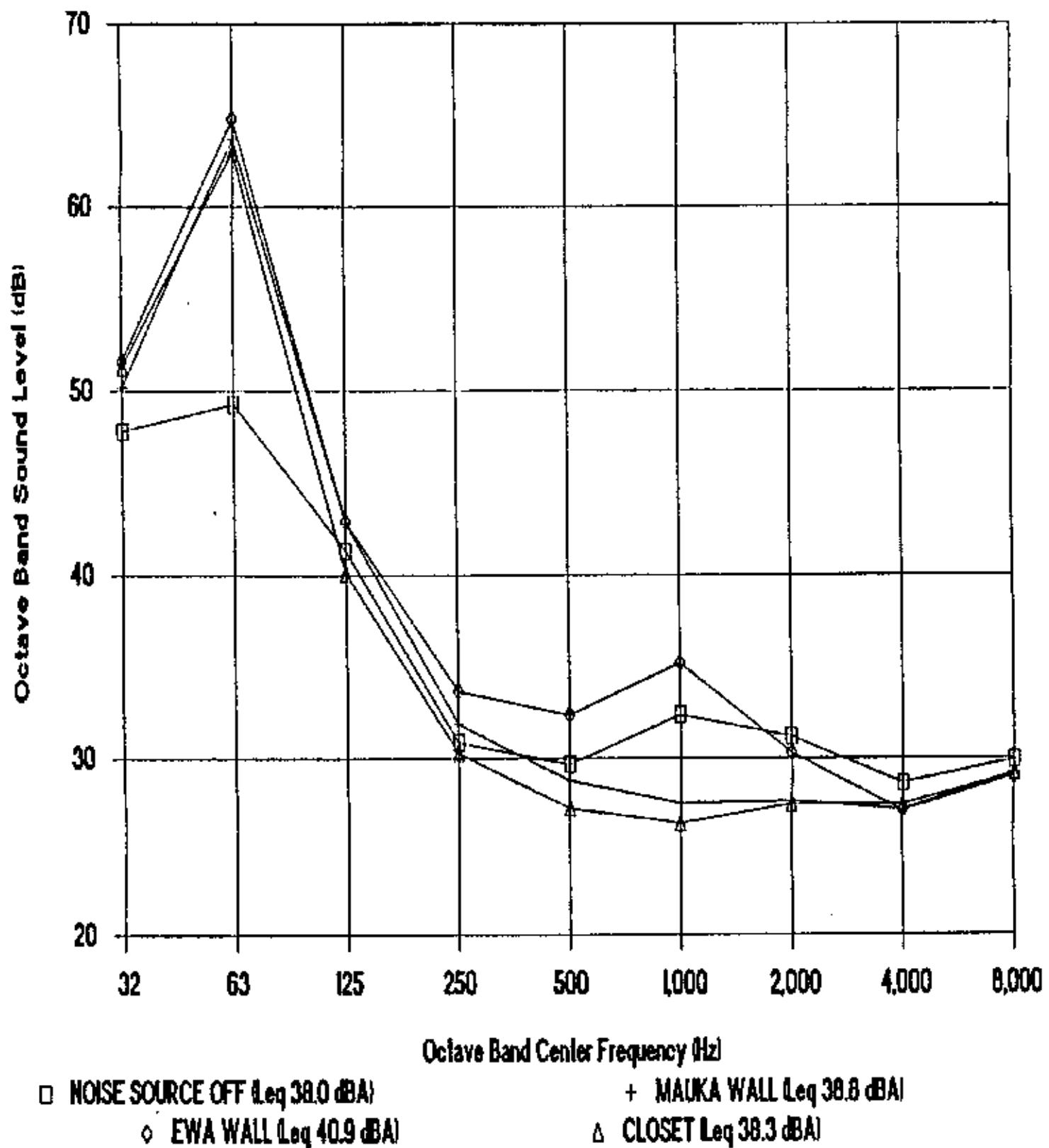
I'm writing about "my noise" because I'm wondering if the brains of the whales, dolphins and other marine inhabitants could be affected and "hurt" even though the noise may not be that loud, but have an additional destructive effect. The noise that bothered me had a strange quality.

I live in a cooperative apartment which I bought into forty-four plus years ago so moving out wasn't considered. I couldn't afford to move out and leave it empty because I would still have to pay the monthly maintenance and I certainly wouldn't want to rent it, or be able to rent it out with that noise.

**NARROW BAND FILTERED NOISE MEASUREMENT DATA
ALONG MAUKA WALL OF APARTMENT #210
(4/1/92)**



OCTAVE BAND FILTERED NOISE MEASUREMENT DATA IN APARTMENT #210 (4/1/92)



Y. Ebisu & Associates
Acoustical and Electronic Engineers

1126 12th Avenue
Room 305
Honolulu, Hawaii 96816
(808) 735-1634

YEA Job #30.022
April 2, 1992

Jan Bappe
2957 Kalakaua Avenue, #210
Honolulu, Hawaii 96815

Subject: Results of Noise Measurements and Field Investigations

Dear Ms. Bappe:

Results of April 1, 1992 Investigations: The source of your complaint was heard, measured, and recorded by me during the early morning hours (1:00 to 2:00 AM) of April 1, 1992. The noise source is a 63 Hz tonal which switched ON and OFF during the early morning monitoring period. The tonal was strongest (or loudest) in the mauka/Diamond Head corner of your Living Room with the lanai's sliding doors open or closed.

The results of the noise measurements in your Living Room are shown in ENCLOSURES 1 and 2. The upward spike of the curves at 63 Hz represents the level of the objectionable tonal. From ENCLOSURE 2, it was concluded that the tonal is approximately 60 to 63 Hz in frequency, and approximately 25 dB above other background ambient noise levels in the apartment. A change of 25 dB from OFF to ON conditions of the noise source is considered to be significant.

Due to the low frequency characteristic of the tonal noise source, the State Department of Health nighttime noise limit of 50 dBA was not exceeded. However, it should be noted that the 63 Hz tonal component did exceed the ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers) recommendation for low frequency noise in apartments by 7 to 15 dB. Based on the large increase in 63 Hz noise when the noise source switches to the ON state, and based on the relatively large exceedance of the noise above the ASHRAE recommendations, I concluded that your complaints are not unreasonable, and that the source of the 63 Hz tonal noise should be found and quieted.

Possible Sources of the 63 Hz Tonal: Based on my visits to your apartment building on March 31 and April 1, as well as the noise measurement results, I concluded that the 63 tonal was not associated with transformer hum from the fire alarm installation in the Office. Transformer hum is normally dominated by noise at 120 Hz (second harmonic of commercial power frequency) rather than

Ms. Jan Bappe

April 2, 1992
Page 2

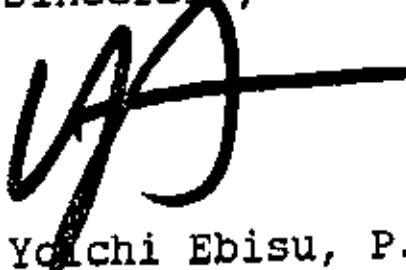
The path of the tonal noise source to your Living Room is believed to be structureborne; i.e., the tonal is probably entering your Living Room via vibrations in your Living Room walls, ceiling, and/or floor. This conclusion was based on the observation that the 63 Hz tonal was 10 to 15 dB lower outside the sliding Lanai door than in the Living Room. In addition, the tonal was detected in the mauka and Ewa walls of the Living Room.

Cooperation from your neighbors will be required to track down the location and identity of the 63 Hz tonal source, which is probably a rotating machine which is attached to or mounted on the apartment building's structure. Portable air conditioning units and refrigerators are possible culprits because their rotating machines (compressors) tend to cycle ON and OFF. Any continuously operating machine, such as the rooftop exhaust fans, are probably not the source of the 63 Hz tonal.

Recommendations: I suggest that you ask for assistance from your neighbors in tracking down the source of the 63 Hz tonal. If you wish I can help you by measuring the 63 Hz tonal with my sound level meter. It may be difficult to hear the 63 Hz tonal in the other apartments if the background noise level is too high, so the investigative work probably should be done in the evening hours between 6:00 and 10:00 PM. If you can gain access to your neighbors' apartments on the second and third floors when the noise source switches ON, we should be able to establish if the source is located above, below, or at the same floor level as your apartment. Once a suspected machinery is located, it should be momentarily turned OFF after the 63 Hz tonal noise source is detected in your apartment. If the 63 tonal noise source switches OFF in your Living Room in conjunction with the shutdown of the suspected machinery, the culprit has probably been identified. A couple of additional ON/OFF cycles should be exercised to confirm the source of the 63 Hz tonal source.

Let me know if you need any additional assistance on this matter.

Sincerely,



Yoichi Ebisu, P.E.

1970 Until uncontrolled sound is recognized as more than a casual annoyance, it will continue to exact a brutal toll on human health.

Useful Poisons In Medicine With Noise

Oscillation

FEARFUL thing happened to us on the way to the 1970s: we became trapped in a dangerous web of noise. Whether it comes in loud, sudden blasts or as a steady high level of sound, noise is loaded with threats to the health of us all. And, ever-increasing, it must now be recognized as a plague that

has reached epidemic proportions. Since 1939, the sound intensity of "community noise" in the power-packed, unmuffled hives of American cities has increased a thousand-fold. Some two million automobiles, trucks and buses pound the streets of New York, Chicago and Los Angeles every working day, creating a continuous roar. Add to this the sounds of industry and construction jackhammers, compressors, air-conditioning units, power generation and materials handling. The loud

est noise to which city dwellers are exposed continues to rise—at an estimated one decibel* each year. Man's annoyance threshold for intermittent sounds, according to the Conservation Foundation, is from 50 to 90 decibels. His pain threshold is 120 decibels. Measure against these the sound of a noisy sports car or a truck (90 db.); a pneumatic jack hammer (94 db.); a lawnmower (107 db.); a riveter (130 db.); a jet plane on takeoff (150 db.). Perception and response are affected not only by the loudness and duration of the sound, but

Perception and Response
Sound is measured in decibels, or tenths of a bel (named for Dr. Alexander Graham Bell). A decibel is the lowest sound detectable by the human ear in quiet surroundings. Decibels increase logarithmically rather than arithmetically, so an increase of three decibels means double the intensity of sound.

and so on his job.

Though amazingly resilient in adaptability to most environments, the body shows no signs of changes, the body shows no sign of an ability to become conditioned to noise. In 1962 and 1963, Dr. Samuel Rosen, professor of ear surgery at New York's Mount Sinai School of Medicine, together with Dr. James and a team of scientists, tested the hearing of Mabaan tribesmen in the Sudan. Living in an atmosphere as nearly noise-free as any on earth, the Africans showed no evidence of hypertension or heart disease, and their hearing remained acute until old age. Yet when exposed to loud noise on the job, they developed tinnitus and permanent hearing loss.

impulsive noises taped in a German steel mill, they exhibited the same autonomic responses, at the same noise levels, as the steelworkers. The toxic force of noise makes itself felt in these areas:

70 (B)

5

noise," says Dr. Rosen, "is only the same as the duration of noise itself. But if the noise lasts hours, recovery may take a good longer."

Dr. Rosen tested the effect of output and hearing reactions in a rock-music group, and noted at a high decibel level of 104. He was not surprised to learn that the lead singer had experienced a transient deafness in his ear. From the severity and duration of this "temporary threshold shift," as it is called, otologists determine a person's susceptibility to noise, and predict the likelihood of permanent hearing loss from continued exposure to loud sounds over a length of time.

Eighteen million Americans suffer from some degree of hearing more than suffer from all other disabilities combined. An estimated one out of three working males are victims of work-connected perceptions of deafness, caused by the continuous impact of loud sounds (over 80 decibels) on the supersensitive hearing mechanism of the ear. There are 34 million Americans who are exposed to such sounds during the working day. Fifty percent of these exposed to more than 95 decibels—in shipyards, foundries, lumber factories and other noisy industries—will have a compensable hearing loss after ten years. The loss is irreversible.

Industry and discorbeques are not the only threats. We are surrounded hundreds of noise-makers, including vacuum cleaners (81 decibels), kitchen blenders (93 decibels), outboard motors (102 decibels), and power mowers (103 decibels), capable of causing hearing loss.

Effects on the Sick. Dr. Irving Fish, assistant professor of neurology at New York University's Medical School, says: "Sufferers from diseases such as heart trouble, asthma, ulcers and gastrointestinal spasms may all be adversely affected by prolonged or sudden noise."

Cardiac patients are particularly vulnerable. Loud noises, such as a bursting paper bag close to the ear, the backfire of a truck, the blast of an auto horn, may produce an autonomic response which can bring on an anginal seizure in a heart patient. Continuous noise is also coming under investigation as a stress factor. In his examination of steel-mill workers exposed to the steady pound of high-volume noise, Dr. Jansen noted an unusually large number with cardiac disorders—apparently the cumulative result of the disturbance in the autonomic nervous system caused by the noise.

The experience of Dr. Vern O. Knudsen, physicist and former chancellor of U.C.L.A., provides a classic example of the effect of noise. While in a hospital undergoing treatment for stomach ulcers, he noted a recurrent pain. Scientific-minded, Knudsen traced the cause to a series of noisy trucks which passed by his hospital window, shocking his ulcer into activity. In self-defense, he invented an earplug

to shut out the truck sounds. (It has been used by millions of GIs to protect their hearing.)

Emotional Damage. "Stress," says Dr. Hans Selye of the University of Montreal, a world authority on the subject, "becomes dangerous when it is unduly prolonged, comes too often, or concentrates on one particular organ of the body." The body, exhausted, loses its ability to resist and so is unable to deal with danger.

During the Korean war, a favorite means used by the North Koreans to weaken the resistance of captured GIs was to put upended buckets over their heads and bang the buckets with a stick. This clang-torture, a combination of noise superimposed on fright and anxiety, broke human spirits more rapidly than did starvation, cold or the non-stop third degree.

Ordinarily, noise by itself would not unhinge a well-adjusted person. But combined with other stress factors—domestic, financial or health—it can be the "triggering trauma" for emotional as well as organic reactions. Thus in New York City a sleepless and out-of-patience housewife, worried about a sick husband, dumped a bucket of water on the garbage man when he ignored her repeated requests to juggle the garbage cans more gently. And a man shot a 13-year-old boy playing in the street, whose shouting, combined with the traffic noise, was making it impossible for him to sleep.

Loss of Sleep. Noise does not relax

its grip on you even when you are

sleeping. Dr. Jansen and Dr. Gunther Lehmann, among others, have used electrocardiographs and electroencephalographs to demonstrate that bursts of sounds—even when mild enough at 55 decibels not to wake the sleeper—are recorded by the brain. And the autonomic nervous system responds just as it does during the waking hours. The effect is to turn a long restorative slumber into a less beneficial series of cat-naps.

Chronically noise-interrupted sleep can have violent effects, particularly on aged or sick people. Dr. Julius Buchwald, a psychiatrist at Downstate Medical Center of the State University of New York, testifying before a state legislative committee on jet noise, cited paranoid delusions, hallucinations, suicidal and homicidal impulses as some of the possible consequences.

Inaudible Sound. Intense noise or vibration at infrasonic levels (below the hearing range) also presents a potential threat to health. These low-frequency waves pass easily through an eight-foot-thick wall.

Directly affecting the brain, they can

cause headaches, loss of equilibrium,

and nausea, as well as damage to the middle ear.

Some machines produce infra-

sounds that are too small to have any effect.

In recent experiments, how-

ever, Vladimir Gavreau, head of the French government's Electro-Acoustic Laboratory in Marseille, has

found that old industrial ventilators,

air-conditioning units and family

about five percent more to manufacture than their noisy counterparts, less than that when produced in mass quantities. Thus a quiet power lawn mower may run \$15 more; a quiet garbage truck, \$2400 more; an air compressor, \$500 to \$1000 more, depending on size.

A public demand for quiet is just beginning to be felt. In 1968 the Evinrude Company produced its first quiet-model outboard motor, which was mounted on rubber and fired its noisy exhaust into the water instead of the air. "But outboard owners want noise—it gives them a sense of speed," some said. Yet in its first year more quiet Evinrude outboards were sold than all its noisy competition combined.

The San Francisco Bay Area—one of the most noise-conscious areas in the United States—is building a new rapid-transit system. An aircraft company won the contract for designing and building the new cars, which will cost considerably more than previously used standard cars.

One feature promised to the public was that the cars would be quiet, and it looks as if they will be.

In the past, whenever limitations for traffic, construction and industrial noise have been discussed, the figures mentioned have usually been between 85 and 90 decibels. But says Dr. Rosen, "If a level is to be set, it should be set where it can eliminate the health hazard." In the light of present medical knowledge, that means a 70-decibel limit. Many U.S. states, cities and towns

all may produce infra-red at "dangerous" levels. The ultra-sound generated in the oil burner, for example, is multiplied by the chimney, which acts as an organ pipe, then multiplied again by nearby rooms whose proportions are responsive to the resonance. Such effects, Dr. Gavreau believes, may help explain such afflictions as "housewife headache."

At the other end of the scale is ultra-sound made up of very short wavelengths, above hearing range. Recently, workers in an English factory began complaining of unbearable headaches, fatigue and nausea. Measurements showed the noise volume to be a tolerable 76 to 80 decibels. When complaints persisted, scientists examined the drilling, welding, soldering and washing devices and discovered that high-intensity ultra-sounds were also being produced. Once these were got rid of by adjustment of the machines, there was an immediate drop-off in symptoms.

Antidote. Noise is a very real and growing national health problem, and steps must be taken to stop it. This will mean setting realistic health standards, and enforcing them. It will also mean redesigning a lot of machinery and equipment.

Suppression of noise depends on isolating the source and by simple mechanical readjustments eliminating its vibrations, or changing the sound-wave energy into heat and dissipating it. Devices designed with noise-inhibition in mind usually cost

do have anti-noise ordinances, but in most cases the language of the law is so out-of-date as to make enforcement impossible. Thus New York City, perhaps the noisiest city on earth, issued only 227 summonses in 1968 for violations of the general anti-noise regulations. California, employing a more practical approach, has set up electronic measuring devices to check the volume of noise in its cities and highways, and is designing freeways with noise abatement in mind.

In Britain today, under the prodig of the Noise Abatement Society, cars must be well enough muffled to pass a road-noise test. In Paris, blowing your horn is specifically forbidden by law, except to avoid an imminent accident. ~~horns to blow~~ Only then will the relentless West German—the industrial city of Dortmund, in particular—has been the leader in effective our health be brought under control.



Pardon, Your Slip Is Showing.

From the Mt. Kisco, N.Y., *Patent Trader*: "This unboring job requires typing, ruining the Xerox machine and all other general office routines."

ANNOUNCEMENT in the Port Byron, Ill., *Globe*: "We welcome to our pulpit the minister of the First Baptist Church, Cordova, a sour guest speaker."

From the Orange County, Calif., Academy of General Practice lecture series bulletin: "The Doctor's Roll in Sex Education."

From the Keene, N.H., *Sentinel*: "In the fields of sewage and air pollution, we can't afford to bury our heads."

HEADLINE in the Oshawa, Ont., *Timer*: "ALL WORK, NO PAY CREATES TENSION."

noise-suppression. Several years ago, noting that Dortmund was being tortured by a noise plague, deputy city manager Helmut Hillman called in the experts. They fashioned a noise map of the city (a technique later borrowed by San Francisco) and set out to quiet the worst portions. Persuasion was used first. But when owners of one factory refused to muffle their machinery on grounds of cost, the case came to trial and a law was invoked that says, "Public health is above any economic consideration." (Dortmund is quiet these days—and with no resulting wave of bankruptcy cases.)

If some measure of quiet is to be restored in the United States, a similar tough policy has to be followed

blowing your horn is specifically for

to avoid an

imminent accident.

Only then will the relentless

shock wave of sound which pollutes

our daily environment and assaults

our health be brought under control.

Hi Jan,

The Board has tasked me with
"sound proofing" the fire alarm panel
in my office. Would you like to help?

Perhaps we can contact Simplex (949-6678)
or Fairway Electric. Let me

know.

The office is below
my apartment.

Mahrle,

Mike



Jan,

Sally Mailer

Apt 108 does

hear a humming

noise too. She's going

to try and figure it out.

She thinks it may be
coming from next door

Hueytowners hear a hum—or do they?

By Hoyt Harwell
Associated Press

April
19
1992

HUEYTOWN, Ala. — Some say it's so loud it disrupts their prayers and keeps them up at night. Others don't hear a thing.

People around here have been hearing the strange and spectral "Hueytown hum" since December, and although there's been plenty of finger-pointing, the source of the sometimes maddening, sometimes humorous droning is a mystery.

Mayor Lillian Howard said she believes it comes from a huge ventilation fan with 12-foot blades that drives hot air out of the mouth of a Jim Walter Resources mine outside this town just west of Birmingham.

Not so, said Dennis Hall, spokesman for the coal mining company.

"We were tried and convicted before we had a chance to defend ourselves," he said. "We've never denied that our fans do make noise but, 6½ miles away, it's hard to comprehend that we're keeping people from sleeping."

Since word of the hum spread, self-styled experts have contacted the mayor offering to find the cause and silence it. For a price, of course.

"I wish everyone would just mind their own business," said John Ennis, attorney for the city of 15,085.

The mayor said she has "not had people coming to me upset or angry."

So far, the mine fan appears to be the leading theory. On Wednesday, the mining company sent Ennis a bundle of charts and information.

"You can't just point your finger at one thing and say this is causing it," Hall said. "If it is our mine, why are there complaints now when the mine has been there since 1974?"

Hall said that atmospheric conditions could enhance the hum, and he noted that large tracts were cleared last year from a pine forest between the fan and the city and that Hueytown is surrounded by industries.

Residents say the hum is loudest at night and extremely loud on cloudy and rainy days. A visitor walking in town on a sunny afternoon could hear no hum.

But Gerald Hicks has heard it.

"People sensitive to noises like this find it very annoying," he said.

"If you let it, it will almost drive you crazy."

REST

8 Reasons to Purchase From Us!

* LARGE SELECTION of all

5. 90 DAYS. NO INTEREST
makes it easy to buy!
SPECIALISTS!

TRAIN IN TUNE: The type of music you listen to when exercising may actually affect your workout. Research at Louisiana State University found that fast, loud rock music increased heart rate and reduced exercise endurance while slower music lowered heart rate and enabled joggers to exercise longer. It appears that the relaxation created by "elevator music" may psychologically make exercise less difficult to perform.

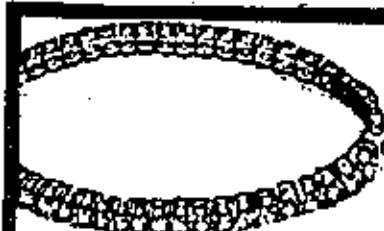
THE WONDER

DRUG?: Before you take two aspirins, know that a couple of researchers at Children's National Medical Center and Columbia Hospital for Women in Washington have found that a by-product of aspirin known as salicylate may impair male fertility by reducing the mo-

medicine for re Amarelinho slum school supplies dren. More than attended his f community center the residents' w

items-or-less express line. It's happened to most of us, Ayem lawn mowers, monster speakers blasting from cars, unsolicited phone-sales pitches, jerks who can't keep quiet in theaters. What gripes you? Send 'em to me, with some 20 items in their baskets in front of you right? Next pet peeve: thoughtless drivers who don't bother signal, tailgaters and able-bodied drivers who don't bother handicapped-only parking stalls. Other peeves: 7 "We don't have to sign with the but acted on dents, who Robson dos S the association Good deeds tactic of traf taken over 680 slum ne tions by thre "Most sl hard-workin pose the d live with have to tions," said ologist. "I tell you an order ment." "They most par things I maid wh had a r man, the an end to and maybe to my life."

...comedianne Tamayo, died ... Touch of class: Japanese series, Davis Rules, requesting a bunch of her TV readers, nurambah one concerned people's grocery shopping habits. Most infuriating: idiots in front of you are or MidWeek cop with some 20 items in their baskets in front of you right? Next pet peeve: thoughtless drivers who don't bother signal, tailgaters and able-bodied drivers who don't bother handicapped-only parking stalls. Other peeves: 7 "We don't have to sign with the but acted on dents, who Robson dos S the association Good deeds tactic of traf taken over 680 slum ne tions by thre "Most sl hard-workin pose the d live with have to tions," said ologist. "I tell you an order ment." "They most par things I maid wh had a r man, the an end to and maybe to my life."



'S' STYLE TENNIS BRACELET

Nine designs to choose from

T/W 1.00 ct.	\$1,250 to \$1,9
*\$450 to *\$495	T/W 4.00 ct.
T/W 2.00 ct.	\$1,490 to \$2,3
*\$850 to *\$990	T/W 5.00 ct.
T/W 3.00 ct.	\$1,750

LARGE

STYL

STYL